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## Mediastinal Masses in Pediatric Patient with Ewing's Sarcoma

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## Case Description

YOUNG, A.R.C. with history of C. living. 5. Sartorius involving 1.1-1.6 cm. Lymphadenopathy found on surveillance imaging. CT scan revealed mass effect (compression & shift) on the trachea and left pulmonary vein secondary to 6x4x3cm paratracheal mass. Additional mediastinal masses were noted and associated with right bronchial compression and large right pleural effusion.

PreOp Vitalis: 106/46 HR 103, RR 20, SpO2 100%. TTE accomplished and revealed normal biventricular systolic function, no outflow tract obstruction. Peripheral I/Ix2 placed by PICC team the night prior. OR prepped with rigid bronchoscopy tray and general surgeon in room. At induction in the event an emergent rigid bronchoscopy is required.

**Anesthetic Management**  
103, RR 20, SpO<sub>2</sub> 100%. TTE accomplished,  
no outflow tract obstruction. Perioperative  
preparation with rigid bronchoscopy tray and  
an emergent rigid bronchoscopy is required.

PT taken to OR for inhalational induction and MRI placement. PR maintained on sevoflurane while breathing spontaneously. PT taken to MRI for scan. After MRI the pt returned back to OR still under general anesthesia, breathing spontaneously. Additional peripheral IV was placed and pre-procedure arterial line placed for hemodynamic monitoring. Laryngoscopy was performed and ETT 5.5 placed to secure airway with surgeons present and rigid bronchoscopy tray available. Spontaneous ventilation maintained throughout and general anesthesia maintained with propofol infusion, dexmedetomidine, ketamine, and volatile anesthetic. Anesthesiologist vigilance and preparation prevented potential airway obstruction and cardiovascular collapse.

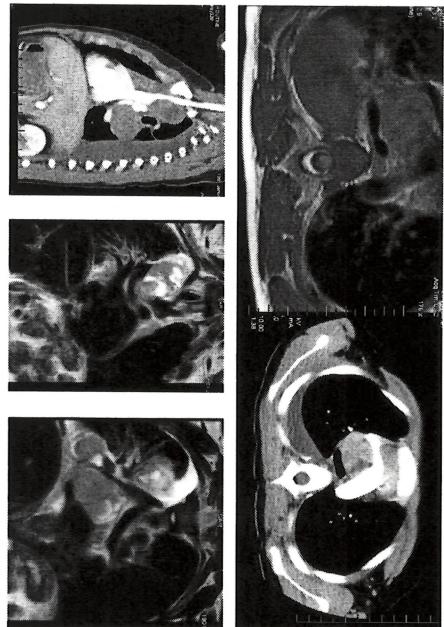
## Mediastinal Mass Obstruction Physiology

- Lung volumes reduced to 500-1500cc- Decrease in tracheobronchial diameter
- Bronchial smooth muscle relaxation for easier compressibility
- Paraparesis eliminates the normal trans-pleural pressure gradient causing enhanced extrinsic compression and decreased airway diameter.

**Pitfalls on Anesthetic Induction**

- Anatomic Effects of Mediastinal Mass
- Compression of cardiac structures- rhythm disturbances, diastolic filling reduction
- Compression of vascular structures- compression of SVC or outflow tracts
- Compression and collapse of airway structures

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## Mediastinal Mass Operative Management

- Eliminate territorial vessels for possible need for cardio-pulmonary bypass in unsure and uncertain category
- Adjust patient position- elevated head of bed and partial or full right lateral decubitus position to maintain airway patency and reduce cardiac and vascular compression
- Invasive arterial monitoring- potential cardiorespiratory instability
- Maintain continuous ventilation if possible

## Emergency Response to Airway Compression

- Awake laryngoscopy
- Inhalational induction
- Secure airway beyond stenosis if possible
- CPAW may help with maintaining functional residual capacity
- Short acting anesthetics and paralytics (avoid if able)
- Rigid bronchoscopy and surgeon available at induction

**Pediatric vs Adult**  
Reported in children  
nous structure of the airway  
of symptoms due to obtaining  
to obtain distal airway is not an

- Children with 50% or greater tracheo-bronchial compression have a greater likelihood of severe complications with general anesthesia.

**Metastatic Mass Pre-Operative Workup**

- Assessment and Grading of symptoms- Related to patients tolerance to lay supine
  - Asymptomatic
  - Mild- Supine with some cough/pressure sensation
  - Moderate- Supine for short periods
  - Severe- Cannot tolerate supine

**CT scan and determination of symptoms**- patients are deemed safe, unsafe, or

uncertain for anesthesia as follows:

pression and collapse of airway structures

- Lung volumes reduced to 500-1500cc. Decrease in tracheobronchial diameter
- Bronchial smooth muscle relaxation for easier compressibility
- Paralysis eliminates the normal trans-pulmonary pressure gradient causing enhanced extrinsic compression and decreased airway diameter.

Center: The U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Air Force, the Department of the Army or the Department of Defense or the U.S. Government.

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